NÖRO PSİKİYATRİ ARŞİVİ

Research Article

Arch Neuropsychiatr 2015; 52: 133-8 • DOI: 10.5152/npa.2015.7248

Assessment of Psychopathology, Quality of Life, and Parental Attitudes in Adolescents with Type 1 Diabetes Mellitus

Nilfer ŞAHİN[1], Didem Behice ÖZTOP[2], Savaş YILMAZ[3], Hatice ALTUN[4]

[1]Department of Child and Adolescent Psychiatry, Muğla Training and Research Hospital, Muğla, Turkey
[2]Department of Child and Adolescent Psychiatry, Erciyes University Faculty of Medicine, Kayseri, Turkey
[3]Department of Child and Adolescent Psychiatry, Konya Necmettin Erbakan University Faculty of Medicine, Konya, Turkey
[4]Department of Child and Adolescent Psychiatry, Kahramanmaraş Sütçü İmam University Faculty of Medicine, Kahramanmaraş, Turkey

ABSTRACT

Introduction: The aim of the present study was to identify psychopathology, parental attitudes, perceptions of quality of life, and relationships between these factors in adolescents with type 1 diabetes mellitus (DM).

Methods: Fifty adolescents (12–18 years old) with type 1 diabetes mellitus and 50 healthy adolescents and their parents were recruited for the study. Clinical interviews with the diabetic adolescents were performed using "Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL)." Both groups completed the "Depression Scale for Children," "State-Trait Anxiety Inventory," and "Health Related Quality of Life Scale for Children," while their parents completed the "Parental Attitude Research Instrument," "The Coping Strategy Indicator," and "Health Related Quality of Life Scale for Children-Parent Form."

Results: The psychological disorder ratio in diabetic adolescents was 68%. No significant difference was found regarding perceptions of quality of life between the diabetic group and control group. However, diabetic adolescents with psychological disorder had reduced perception of quality of life than those without psychological disorder. Among parental attitudes, an authoritarian attitude was found to be more common in the diabetic group. It was found that among coping strategies, parents in the diabetic group use avoidance more commonly.

Conclusion: In the present study, a high rate of psychopathology was detected among adolescents with type 1 DM. In addition, no clear impairment in quality of life was reported in patients with type 1 DM; however, there was worsening in the perception of quality of life in the presence of psychiatric disorders accompanying diabetes. It was found that parents of diabetic children use inappropriate coping strategies and negative parental attitudes more often than those of healthy controls.

Keywords: Type 1 diabetes mellitus, psychopathology, quality of life, parental attitude, parental coping strategies

INTRODUCTION

Chronic diseases occur because of pathological changes and are defined as conditions showing deviation from the normal, resulting in possible permanent disability and requiring special education, long term care, supervision, and control for the rehabilitation of the patient (1). Diabetes mellitus (DM) is a chronic disease characterized by carbohydrate, protein, and lipid metabolism disorders as a result of insulin secretion deficiency or various degrees of insulin resistance. The incidence of DM in children and adolescents is 0.1%.

Significant progress in diagnosis and treatment approaches of diabetes mellitus in recent years has led to longer life expectancy, while increasing psychosocial problems in chronically ill children-adolescents and their parents. DM forms the basis of psychosocial problems because it includes invasive treatment methods and often presents with complications. Frequent insulin injections, blood glucose measurements, diet, and obligatory exercises negatively affect the lives of children and adolescents with type 1 DM (2,3). In addition, the intensive treatment constitutes a heavy burden on adolescents and their family relationships (4). Perception of the disease and its effect on life may lead to psychiatric conditions. In addition, diabetes and related complications may affect brain functions, leading to psychiatric disorder (5). Furthermore, parental emotional problems, responses to them, and the way parents cope may have an effect on children and adolescents (6). In general, patients are well followed with regard to the regulation of blood sugar levels and possible complications; however, they are not sufficiently evaluated and do not receive appropriate treatment for psychiatric disorders.

The aim of the present study was to evaluate psychiatric disorders in adolescents with type 1 DM; to determine the risk factors predisposing to these disorders; and to determine the relationship between parental attitudes and their methods of coping with anxiety and the psychiatric disorders in adolescents and their effect on quality of life.

Correspondence Address: Dr. Nilfer Şahin, Department of Child and Adolescent Psychiatry, Muğla Sıtkı Koçman Univeristy Faculty of Medicine, Muğla, Turkey Phone: +90 252 211 51 77 E-mail: nilfersahin@hotmail.com

Received: 17.05.2013 **Accepted:** 02.01.2014

METHODS

Participants and Procedures

The study included data of 50 adolescents with type 1 DM between the age of 12–18 years who were followed-up and treated continuously for at least 6 months with insulin at the Pediatric Endocrinology Department and their parents. Patients with mental retardation and other chronic diseases were excluded from the study. The control group consisted of 50 adolescents visiting the Social Pediatrics Polyclinic without any chronic disease, matching age, sex, and education level and their parents. Adolescents and their parents were evaluated by pediatric psychiatrists included in the study according to DSM-IV-TR to exclude any psychiatric disorder. The study was approved by the Erciyes University Medical Faculty Ethics Committee (03.05.2010, Approval no.: 2010/34). Written consent was obtained from the patients and parents. The diabetic group was given data form consisting of time of diagnosis, duration of insulin use, presence of complications, number of hospitalizations, and compliance to diet. According to the data obtained by the diabetic adolescents and their parents, compliance to diet was grouped as good, moderate, and poor. Adolescents in the diabetic and control groups were asked to fill the Quality of Life Scale for Children, Children's Depression Inventory, and State-Trait Anxiety Inventory in a quiet room. Parents were asked to fill the Quality of Life Scale for Children-Parent Form, Coping Strategy Indicator, and Parental Attitude Research Instrument. Those who came with both parents completed the forms in a quiet room, and if one parent was absent, the forms were completed by the parents together. In addition, children and parents from the type 1 DM group were evaluated by a pediatric psychiatrist using Schedule for Affective Disorders and Schizophrenia for School Age Children–Present and Lifetime Version (K-SADSPL).

Data Collection Tools

K-SADSPL

K-SADSPL is a semi-structural interview form developed in 1997 by Kaufman et al. to determine past and present psychopathologies in children and adolescents according to DSM-III-R and DSM-IV diagnostic criteria (7). K-SADS-PL gives information about symptoms in already diagnosed patients and does not asses the severity of symptoms. K-SADS-PL is implemented by interviewing the parents and the child, and eventually, evaluation is made in accordance with the information received from all sources (mother, father, child, school, and others). If a discrepancy between the information from different sources is present, clinicians use their clinical judgment. It was adapted by Gökler et al. (8) in Turkish in 2004.

Children's Quality of Life Scale (CQLS)

CQLS was developed in 1999 by Varni et al. (9) to evaluate health-related quality of life in children and adolescents aged 2–18 years. CQLS consists of seven forms: parental form for children and adolescents aged 2–4, 5–7, 8–12, and 13–18 years and self-report forms for children and adolescents aged 5–7, 8–12, and 13–18 years. This scale questions the last month of children and adolescents. CQLS consists of 23 items questioning physical health, emotional functioning, social functioning, and functioning in school. Scoring is made in three fields: total scale score (TSS), total physical health score (TPHS), and total psychosocial health scores (TPHS) obtained from emotional, social, and school performance item scores. As a result, higher CSLS scores mean higher life quality related to health. The reliability and validity of the scale was determined by Memik et al. (10) in 2008.

Children's Depression Inventory (CDI)

It was developed by Kovac (11) in 1980 to measure depression levels in children. The scale contains three choices and 27 items and can be used in patients aged 6–17 years. The cut-off point is 19, and the highest possible score is 54. The total score shows the severity of depression. The adaptation to our country was made by Öy (12) in 1991.

State-Trait Anxiety Inventory (STAI)

It was developed by Spielberger (13) in 1973, and validity and safety studies for the Turkish were conducted by Öner (14) in 1995. It consists of two scales, namely State Anxiety and Trait Anxiety, both of the Likert type, made of 20 items, scored from 1 to 4. State Anxiety Inventory shows the feelings of a person at any given moment under certain conditions. STAI determines the feelings of the person regardless of the condition and circumstances. Scoring changes between 20 and 80 for both scales, and the rise of scores shows the rise of anxiety.

Parental Attitude Research Instrument (PARI)

It is a Likert-type scale made of 60 items, developed by Shaffer and Bell (15); validity and safety studies for the Turkish were conducted by Küçük et al. (16). The scale is used to evaluate the parental attitudes on child rearing. The internal consistency coefficient of the scale is 0.91. PARI consists five dimensions: excessive motherhood (F1), democratic attitude and recognition of equality (F2), hostile and rejective attitude (F3), spousal misunderstanding (F4), and an authoritarian attitude (F5). Increase in scores, aside from "a democratic attitude and recognition of equality," shows negative parental attitudes. Factor scores are evaluated for each subscale; no total scores are obtained.

Coping Strategy Indicator (CSI)

Developed by Amirkhan (17); validity and safety studies were performed by Aysan (18). It consists of 33 items, each consisting of 11 items of problem solving (PS), seeking for social support (SSS), and avoidance (K) subscales. All items are reversed and calculated. Subscales score between 11 and 33. High subscale scores indicate a rise in the qualities defined. Cronbach alpha reliability coefficient was found to be 0.84.

Statistical Analysis

Statistical analysis was performed with Statistical Package for Social Science (SPSS Inc., Chyicago, IL, USA) for Windows 17.0" program. The comparison of patients and controls was performed using Student's t test. Categorical data were compared using chi-square test. Descriptive statistical values such as median, standard deviation for continuous data (age, scale scores, and others) were also provided. The relationship of patients' and controls' sociodemographical, clinical, and scale scores were evaluated with Pearson correlation analysis for parametric and Spearman relation analysis for nonparametric data. $p<0.05$ was found to be statistically significant.

RESULTS

The participants in the diabetic group and control group were 26 (52%) male and 24 (48%) female, with average age of 14.54±1.69 years. The average age of diagnosis in the diabetic group was 9.84±2.85 years. The average duration of insulin use was 4.63±3.16 years, and the average number of hospitalization was 2.04±1.71. The diabetes-related chronic complication rate was 12% (6 cases). Diabetic patients were grouped into three groups with regard to diet compliance. According to this, 16 (32%) patients had good, 19 (38%) patients had moderate, and 15 (30%) patients had poor compliance.

According to K-SADS-PL, the rate of psychiatric disorders was 68% in the diabetic group. Of the diabetic patients, 19 (38%) had only one psychiatric disorder, eight (16%) had two disorders, and five (10%) had three different disorders. The diagnosis distribution is summarized in Table 1.

Table 1. Psychiatric diagnoses of diabetic patients

	n (%)
Adjustment disorder	10 (20)
Social phobia	9 (18)
Specific phobia	7 (14)
Major depressive disorder/dysthymia	8 (16)
Generalized anxiety disorder	6 (12)
Attention deficit hyperactivity disorder	6 (12)
Oppositional defiant disorder	3 (6)
Behavioral disorder	1 (2)
Enuresis nocturna	1 (2)
Post-traumatic stress disorder	1 (2)

Table 2. Children's Depression Scale between Groups, State-Trait Anxiety Inventory, and Quality of Life Scale Scores

	Diabetic group Mean±SD	Control group Mean±SD	P
CDIS	10.42±7.27	9.56±6.19	0.526
SAIS	35.36±9.27	34.86±9.06	0.786
TAIS	38.6±9.14	41.32±8.05	0.118
TSSC	74.01±16.52	77.16±10.60	0.258
PHTSC	72.19±21.32	77.24±14.17	0.166
PSHTSC	74.98±16.56	77.25±11.56	0.428
TSSF	68.05±15.06	71.60±12.57	0.204
PHTSF	62.80±19.94	68.50±20.20	0.159
PSHTSF	70.76±16.16	73.27±13.12	0.397

Student's t test. CDIS: Children's Depression Inventory Scores; SAIS: State Anxiety Inventory Scores; TAIS: Trait Anxiety Inventory Scores; TSSC: Total Scale Scores-Children; PHTSC: Physical Health Total Score-Children; PSHTSC: Psychosocial Health Total Scores-Children; TSSF: Total Scale Scores-Family; PHTSF: Physical Health Total Scores-Family; PSHTSF: Psychosocial Health Total Scores-Family; p: minimum level of significance; SD: standard deviation

No statistically significant difference was found between the two groups with regard to CDI, SAI, TAI, and LQS (Table 2). In contrast, the average CDI scores in patients diagnosed with depression were found to be 20.37±7.81 for the diabetic group and 9.56±6.19 for the control group. This difference was found to be statistically significant ($p<0.001$). In the diabetic group, SAI and TAI average points in patients with Generalized Anxiety Disorder were found to be 45.33±8.45 and 50.00±12.13, respectively. For the control group, these values were 34.86±9.06 and 41.32±8.05, respectively. These differences were found to be statistically significant ($p=0.01$ and $p=0.02$, respectively).

A negative correlation was detected in all scores from the subgroups of CQL and CDI, SAI, and TAI (Table 3). In the diabetic group, those with psychiatric disorders had statistically significant lower CQL subgroup scores than those without any disorders (Table 4).

While a positive correlation was detected in the diabetic group between psychiatric disorders and diet compliance, there was no significant relationship between sex, time of diagnosis, duration of insulin use, presence of complications, and number of hospitalizations (Table 5). The comparison of diabetic and control group PARI subgroup scores showed statistically significant high scores of the authoritarian attitude (F 5) in the diabetic group. In the CSI subgroup scores, parental avoidance subgroup scores were significantly higher (Table 6). In the diabetic group, compared with the presence of psychiatric disorders, no significant relationship was found between parental attitudes and coping strategies disorders (Table 7).

DISCUSSION

High rates of psychiatric disorders were found in our study where adolescents with type 1 DM were evaluated for psychopathology, quality of life, parental attitudes, and parental strategies of coping with stress in comparison with the control group. There was no significant difference between the diabetic group and control group with regard to the perception of quality of life. However, compared with diabetic adolescents without psychiatric disorders, diabetic adolescents with psychiatric disorders were found to have lower perceptions of quality of life. In the diabetic group, a significant relationship was found between diet compliance and the presence of psychiatric disorder; however, there was no significant relationship between psychiatric disorders and factors such as time of diag-

Table 3. Correlation between Life Quality Scale Scores and Children's Depression Scale, State-Trait Anxiety Inventory Scores in the Working Group

			TSSC	PHTSC	PSHTSC	TSSF	PHTSF	PSHTSF
Patients	CDIS	r	−0.797	−0.513	−0.857	−0.249	−0.011	−0.349
		p	<0.001	<0.001	<0.001	0.081	0.940	0.013
	SAIS	r	−0.543	−0.434	−0.525	−0.247	−0.096	−0.290
		p	<0.001	0.002	<0.001	0.084	0.508	0.041
	TAIS	r	−0.693	−0.532	−0.687	−0.310	−0.016	−0.435
		p	<0.001	<0.001	<0.001	0.028	0.914	0.002
Control	CDIS	r	−0.489	−0.100	−0.627	−0.301	−0.047	−0.399
		p	<0.001	0.490	<0.001	0.034	0.746	0.004
	SAIS	r	−0.384	−0.134	−0.441	−0.253	−0.004	−0.354
		p	0.006	0.355	0.001	0.076	0.981	0.012
	TAIS	r	−0.453	−0.148	−0.543	−0.295	−0.037	−0.414
		p	0.001	0.304	<0.001	0.037	0.797	0.003

Pearson and Spearman Correlation Analysis. TSSC: Total Scale Scores-Children; PHTSC: Physical Health Total Scores-Children; PSHTS-C: Psychosocial Health Total Scores-Children; TSSF: Total Scale Score-Family; PHTSF: Physical Health Total Score-Family; PSHTSF: Psychosocial Health Total Score-Family; CDIS: Children's Depression Inventory Score; SAIS: State Anxiety Inventory Score; TAIS: Trait Anxiety Inventory Score; r: correlation coefficient

nosis, sex, duration of insulin use, presence of complications, and number of hospitalizations.

It is a well-known fact that people with chronic diseases have a higher risk of psychopathologies. It is also reported that the rates of psychiatric disorders in young adults and adolescents with type 1 DM are two–threefold higher than those in the general population (19). Different psychiatric diagnoses in adolescents and young adults are reported in the literature, and in many studies, the number of patients with multiple psychiatric diagnoses has been reported to be high (20,21). When we look at the distribution of diagnoses in children and adolescents with type 1 DM, anxiety, depression, adjustment disorder, and eating disorders prevalence are found to be higher than those in the general population (22). In a study conducted by Blanz et al. (23), the prevalence of psychiatric disorders in diabetic patients was found to be 33.3% and that in the control group patients was found to be 9.7%; in the diabetic group, introversion symptoms, particularly somatic symptoms, sleeping disorders, compulsions, and depressive mood rates, were found to be higher than those in the control group. In another study including patients aged 2–25 years, 58.2% of 175 diabetic patients had one psychiatric disorder meeting the DSM-IV diagnosis criteria. Anxiety disorder (19%) and eating disorder (18%) prevalence rates were high in the diabetic group in the same study (24). In a study conducted by Kovacs et al. (25), 36% of 92 diabetic patients between the age of 8–13 years were found to be diagnosed with adjustment disorder. In another study of theirs with a 10-year follow-up of type 1 DM patients, approximately 47.6% developed a psychiatric disorder [depressive disorder (26%), anxiety disorders (20%), and behavioral disorders (16%)] (19). In a study performed in our country on children and adolescents with type 1 DM, the prevalence of anxiety was 47.3% and that of somatization was 50.9% (26). The prevalence of psychiatric disorders in our study was found to be partially higher than that reported in the literature. All the previous studies evaluated specific diagnostic conditions and did not contain a full mental status evaluation. Our study was conducted to assess all psychiatric disorders; therefore, it is thought that it will contribute to this ratio. The high rates of psychiatric disorders indicates that diabetes may be a risk factor for psychiatric disorders. However, the control group consists of adolescents without any psychiatric disorders; therefore, diabetic and nondiabetic adolescents were not compared with regard to psychiatric disorders. The control group of our study does not consist of community subjects and clinical evaluations were not performed using K-SADS-PL; therefore, the risk of psychiatric disorders caused by diabetes is not clearly presented. This is considered to be one of the limitations.

There was no statistically significant difference in the diabetic and control groups with regard to depression and anxiety scores. In the literature, anxiety and depression scores are reported to be higher than those in the control group (27). However, it has been reported that anxiety and depression scores are similar to those in the control group (28). High rates of psychiatric disorders (68%) in the diabetic group lead us to expect higher anxiety and depression scores in the control group. Of 34 patients with psychiatric disorders, eight (16%) had depression and six (12%) generalized anxiety disorder; the number of patients diagnosed with adjustment disorder, specific phobia, disruptive behavior disorder, and enuresis is considerably high and may explain the insignificant difference of depression and anxiety scores between the groups. In addition, the insignificant difference between the diabetic and control groups with regard to this scale scores may be a result of nonreflective high scale scores of the diabetic group diagnosed with anxiety and depression to the overall average and the small sample size. The scales used are based on self report; therefore, this may have also contributed to the condition.

Table 4. Life Quality Scale Scores According to the Presence of Psychiatric Disorders in the Diabetic Group

	Psychiatric disorder in the diabetic group		
	Yes	No	
	Mean±SD	Mean±SD	p
TSSC	69.13±15.93	84.36±12.85	0.002
PHTSC	67.37±22.24	82.41±15.26	0.018
PSHTSC	70.12±16.14	85.31±12.44	0.002

Student's t test. TSSC: Total Scale Score-Children; PHTSC: Physical Health Total Score-Children; PSHTSC: Psychosocial Health Total Score-Children; SD: standard deviation

Table 5. Relationship between Demographic Data and the Presence of Psychiatric Disorder

	Presence of psychiatric disorder		
	r	p	n
Age	−0.035	0.81	50
Sex	−0.230	0.108	50
Time of diagnosis	−0.069	0.633	50
Duration of insulin use	0.029	0.842	50
Noncompliance to diet	0.309	0.029	50
Presence of complication	−0.011	0.942	50
Number of hospitalization	0.117	0.417	50

Pearson and Spearman Correlation Analysis. r: correlation coefficient; p: minimum level of significance

Table 6. Comparison of Parental Attitude Research Instrument and Coping Strategies Scale Points between Diabetic and Control Groups

		Diabetic group	Control group	p
		Mean±SD	Mean±SD	
PARI	F1	50.12±8.35	48.14±9.31	0.266
	F2	26.56±3.26	27.56±3.20	0.126
	F3	31.02±7.14	30.20±6.21	0.542
	F4	16.48±3.88	16.18±4.06	0.707
	F5	44.82±8.89	38.88±8.64	0.001
CSI	PS	26.84±3.88	26.12±3.77	0.350
	SSS	23.06±6.87	23.38±5.69	0.800
	A	22.02±3.72	19.98±4.29	0.013

Student's t test. PARI: Parental Attitude Research Instrument; F1: factor 1 (excessive motherhood); F2: factor 2 (democratic attitude and recognition of equality); F3: factor 3 (hostile and rejective attitude); F4: factor 4 (spousal misunderstanding); F5: factor 5 (authoritarian attitude); CSI: coping strategies indicator; PS: problem solving; SSS: searching for social support; A: avoidance; SD: standard deviation

Table 7. Relationship between Parental Attitudes in the Diabetic Group and Coping Strategies and the Presence of Psychiatric Disorder

		PARI					CSI		
		F1	F2	F3	F4	F5	SSS	PS	A
Psychiatric disorder	r	-0.013	-0.117	0.076	0.007	0.070	0.033	0.267	0.160
	p	0.926	0.419	0.601	0.959	0.629	0.821	0.061	0.268

Pearson and Spearman Correlation Analysis. PARI: Parental Attitude Research Instrument; F1: factor 1 (excessive motherhood); F2: factor 2 (democratic attitude and recognition of equality); F3: factor 3 (hostile and rejective attitude); F4: factor 4 (spousal misunderstanding); F5: factor 5 (authoritarian attitude); CSI: coping strategies indicator; PS: problem solving; SSS: searching for social support; A: avoidance

There was no significant difference in scores of quality of life scale between the diabetic and control groups. These findings show similarities with some studies conducted in the literature (29,30). However, worse outcomes have been reported in children and adolescents with type 1 DM with regard to perception of quality of life in comparison with healthy controls (31). It has been reported that children and adolescents with chronic diseases had difficulties in adapting to many changes in their everyday life; however, they adapted with time and their initially impaired perception of quality of life got better with time (32). The participants included in our study had been using insulin for at least 6 months; therefore, we believe that their perception of quality of life has improved with time.

The perception of quality of life in the diabetic group was found to be worse than that in the control group. In addition, as depression and anxiety scores rise, quality of life scores in adolescents fall. In a study performed on diabetic adolescents with symptoms of depression and eating disorder, their perception of quality of life was shown to be worse (33). As a result, it should be considered that psychiatric disorders, mainly depression accompanied by physical diseases may negatively affect quality of life and may contribute to the development of psychiatric disorders. The evaluation of the relationship between noncompliance to diet and psychiatric disorders in the diabetic group showed a positive correlation. Psychiatric disorder rates rose as the compliance to diet worsened, or the presence of psychiatric disorder worsened the compliance. Deterioration in the control of blood glucose levels, physician controls, rise in acute and chronic complications, and hospitalization are expected in the worsening of compliance to diet. All these demanding factors may have a negative effect on the mental condition of adolescents. On the other hand, the present depressive mood, attention problems, impulsivity, and behavioral problems may disrupt diet compliance. Studies have focused on the relationship between metabolic control and psychiatric disorders, and to assess this condition, the HbA1c level, which is a marker for metabolic control, has been measured. In many studies, a positive correlation has been found in type 1 DM metabolic control difficulties and psychiatric disorders (34,35). In our study, dietary compliance was determined on the basis of the information obtained by the patients and their parents, while HbA1c levels were not determined; therefore, we believe that this is one of the limitations of our study.

The absence of significant relationship between psychiatric disorders and the time of diagnosis, duration of insulin use, number of hospitalizations, and presence of chronic complications may be related to the duration of insulin use for a lifelong health condition, being 4.63 years on average, and to the fact that in that period of time, the possible chronic complications may not be severe.

In the diabetic group, parents exhibited authoritarian attitudes more dominantly, and in the same group, they used avoidance more commonly as a method for coping with anxiety. We believe that authoritarian attitudes in parents of the diabetic group may result from the intense anxiety related to diabetes and may be an effort to provide metabolic control and that high avoidance scores in CSI may be a mechanism they use to cope with stress.

It has been shown that chronic diseases, diabetes, and their treatment affect daily family life and lead to anxiety, stress, and family conflicts (36). Furthermore, when parents are concerned about diabetes, its treatment, and long-term complications, they express them by intrusive behaviors such as faultfinding, rebuking, constantly asking questions, and giving orders (37). It is interesting that when parents are more involved in the treatment of diabetes, children make less mistake in self care and have better metabolic control and compliance with the disease (38,39).

There was no relationship between the presence of psychiatric disorders in adolescents in comparison with parental attitudes and coping methods. It has also been reported that in the literature, overprotective parental attitudes are related to introversion in adolescents (40). In contrast to these findings and consistent with our findings, it has been indicated that conflicts between children and parents are unrelated to the emotional problems found in adolescents (41).

In conclusion, we concluded that quality of life is not negatively affected in adolescents; however, many psychiatric disorders may accompany the clinical manifestations and quality of life is deteriorated in the presence of psychiatric disorders. It should also be considered that psychiatric disorders play an important role in the control of diabetes. Psychological symptoms may affect current treatment and the course of diabetes and may often escape the attention of clinicians. Our study reveals the necessity of consultation and liaison. Collaboration between clinics would help improve the quality of life in patients, avoid the complications that may occur, and thereby lower the costs of the treatment provided. In addition, diabetes affects parents negatively, leading to inappropriate attitudes. This can make it difficult for adolescents to adapt to treatment. To prevent negative behavior that may arise, family training programs would be useful. Larger studies on psychiatric disorders and parental attitudes accompanying diabetes and other chronic diseases affecting children psychopathology, parental attitudes, perception of quality of life, and relationships between them should be performed because it affects the quality of life and treatment expenses.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Er MD. Çocuk, hastalık, anne-babalar ve kardeşler. Çocuk Sağlığı ve Hastalıkları Dergisi 2006; 49:155-168.
2. Hart HE, Redekop WK, Bilo HJ, Meyboom-de Jong B, Berg M. Health related quality of life in patients with type I diabetes mellitus: generic & disease-specific measurement. Indian J Med Res 2007; 125:203-216.
3. Rubin RR, Peyrot M. Quality of life and diabetes. Diabetes Metab Res Rev 1999; 15:205-218.
4. Effect of intensive diabetes treatment on the development and progression of long-term complications in adolescents with insulin-dependent diabetes mellitus: Diabetes Control and Complications Trial. Diabetes Control and-Complications Trial Research Group. J Pediatr 1994; 125:177-188. [CrossRef]
5. Fritsch SL, Overton MW, Robbins DR. The interface of child mental health and juvenile diabetes mellitus. Child Adolesc Psychiatr Clin N Am 2010; 19:335-352. [CrossRef]
6. Jaser SS, Whittemore R, Ambrosino JM, Lindemann E, Grey M. Mediators of depressive symptoms in children with type 1 diabetes and their mothers. J Pediatr Psychol 2008; 33:509-519. [CrossRef]
7. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, Williamson D, Ryan N. Schedule for Affective Disorders and Schizophrenia for School-Age Children- Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. J Am Acad Child Adolesc Psychiatry 1997; 36:980-988. [CrossRef]
8. Gökler B, Ünal F, Pehlivantürk B, Kültür EÇ, Akdemir D, Taner Y. Reliability and Validity of Schedule for Affective Disorders and Schizophrenia for School Age Children-Present and Lifetime Version-Turkish Version (K-SADS-PL-T). Turk J Child Adolesc Ment Health 2004; 11:109-116.
9. Varni JW, Seid M, Rode CA. The Peds QL: measurement model for the pediatric quality of life ınventory. Med Care 1999; 37:126-139. [CrossRef]
10. Memik NÇ, Ağaoğlu B, Coşkun A, Karakaya I. The Validity and Reliability Of Pediatric Quality Of Life Inventory In 8- 12 Year Old Turkish Children. Turk J Child Adolesc Ment Health 2008; 15:87-98.
11. Kovacs M. Rating scales to assess depression in school-aged children. Acta Paedopsychiatr 1981: 46:305-315.
12. Öy B. Çocuklar için depresyon ölçeği: geçerlilik ve güvenirlik çalışması. Turk Psikiyatri Derg 1991; 2:132-135.

13. Spielberger CD, Gorsuch RL, Lushene RE. Manual for State-Trait Anxiety Inventory. California: Consulting Psychologist Press 1970.
14. Öner N, Le Compte A. Durumluk-Sürekli Kaygı Envanteri El Kitabı, Boğaziçi Üniversitesi Yayımları İstanbul; 1985.
15. Schaffer ES, Bell R. Development of a parental attitude research instrument (PARI). Child Dev 1958; 29:339-361. [CrossRef]
16. Küçük S. The Validity of the Turkish Form of PARI Subscales. Yayımlanmamış Doktora Tezi, Boğaziçi Üniversitesi İstanbul; 1987.
17. Amirkhan JH. Criterion validity of a coping measure. J Pers Assess 1994; 62:242-261. [CrossRef]
18. Aysan F. Başa Çıkma Stratejisi Ölçeğinin üniversite öğrencileri için geçerliği, güvenirliği. 1. Eğitim Bilimleri Kongresi Bildiriler Kitabı. Adana: Çukurova Üniversitesi Basımevi; 1994; s:1158-1168.
19. Kovacs M, Goldston D, Obrosky D, Bonar LK. Psychiatric disorders in youths with IDDM: rates and risk factors. Diabetes Care 1997; 20:36-44. [CrossRef]
20. Goldston DB, Kelley AE, Reboussin DM, Daniel SS, Smith JA, Schwartz RP, Lorentz W, Hill C. Suicidal ideation and behavior and noncompliance with the medical regimen among diabetic adolescents. J Am Acad Child Adolesc Psychiatry 1997; 36:1528-1536. [CrossRef]
21. Northam EA, Matthews LK, Anderson PJ, Cameron FJ, Werther GA. Psychiatric morbidity and health outcome in Type 1 diabetes–perspectives from a prospective longitudinal study. Diabetes Med 2005; 22:152-157. [CrossRef]
22. Vila G, Robert JJ, Jose J, Mouren-Simeoni MC. Insulin-dependent diabetes mellitus in children and in adolescents: value of pedopsychiatric follow-up. Arch Pediatr 1997; 4:615-622. [CrossRef]
23. Blanz BJ, Rensch-Riemann BS, Fritz-Sigmund DI, Schmidt MH. IDDM is a risk factor for adolescent psychiatric disorders. Diabetes Care 1993; 16:1579-1587. [CrossRef]
24. Dantzer C, Swendsen J, Maurice-Tisonc S, Salamon R. Anxiety and depression in juvenile diabetes: a critical review. Clin Psychol Rev 2003; 23:787-800. [CrossRef]
25. Kovacs M, Ho V, Pollock M. Criterion and predictive validity of the diagnosis of adjustment disorder: a prospective study of youths with new-onset insulin dependent diabetes mellitus. Am J Psychiatry 1995; 152:523-528. [CrossRef]
26. Arıkan Ş, Antar S. Diyabet Kampına Katılan Ergen ve Çocukluk Çağındaki Tip 1 Diyabetik Hastaların Ruhsal Bulgu ve Belirtilerinin Değerlendirilmesi. Dicle Tıp Dergisi 2007; 34:294-298.
27. Grey M, Cameron ME, Lipman TH, Thurber FW. Psychosocial status of children with diabetes in the first 2 years after diagnosis. Diabetes Care 1995; 18:1330-1336. [CrossRef]
28. Martinez Chamorro MJ, Lastra Martínez I, Luzuriaga Tomás C. Psychosocial characteristics of children and adolescents with type 1 diabetes mellitus. An Esp Pediatr 2001; 55:406-412. [CrossRef]
29. Laffel LM, Connell A, Vangsness L, Goebel-Fabbri A, Mansfield A, Anderson BJ. General quality of life in youth with type 1 diabetes: relationship to patient management and diabetes-specific family conflict. Diabetes Care 2003; 26:3067-3073. [CrossRef]
30. Memik NÇ, Ağaoğlu B, Coşkun A, Hatun Ş, Ayaz M, Karakaya I. Evaluation of quality of life in children and adolescents with Type 1 Diabetes Mellitus. Turk J Child Adolesc Ment Health 2007; 14:133-138.
31. Kalyva E, Malakonaki E, Eiser C, Mamoulakis D. Health-related quality of life (HRQoL) of children with type 1 diabetes mellitus (T1DM): self and parental perceptions. Pediatr Diabetes 2011; 12:34-40. [CrossRef]
32. Eiser C, Morse R. A review of measures of quality of life for children with chronic illness. Arch Dis Child 2001; 84:205-211. [CrossRef]
33. Grylli V, Wagner G, Hafferl-Gattermayer A, Schober E, Karwautz A. Disturbed eating attitudes, coping styles, and subjective quality of life in adolescents with Type 1 diabetes. J Psychosom Res 2005; 59:65-72. [CrossRef]
34. Kovacs M, Mukerji P, Iyengar S, Drash A. Psychiatric disorder and metabolic control among youths with IDDM. A longitudinal study. Diabetes Care 1996; 19:318-323. [CrossRef]
35. Wake M, Hesketh K, Cameron F. The Child Health Questionnaire in children with diabetes: cross sectional survey of parent and adolescent reported functional health status. Diabet Med 2000; 17:700-707. [CrossRef]
36. Anderson BJ, Coyne JC. Family context and compliance behavior in chronically ill children In: Krasnegor N, Epstein I, Johnson SB, Yaffe SJ, editörler. Developmental Aspects of Health Compliance Behavior içinde. Hillsdale NJ: Lawrence Erlbaum; 1993; s: 77-89.
37. Weinger K, O'donnell KA, Ritholz MD. Adolescent views of diabetes-related parent conflict and support: a focus group analysis. J Adolesc Health 2001; 29:330-336. [CrossRef]
38. Wysocki T, Taylor A, Hogh BS, Linscheid TR, Yeates KO, Naglieri JA. Deviation from developmentally appropriate self-care autonomy. Association with diabetes outcomes. Diabetes Care 1996; 19:119-125. [CrossRef]
39. Weissberg-Benchell J, Glasgow AM, Tynan WD, Wirtz P, Turek J, Ward J. Adolescent diabetes management and mismanagement. Diabetes Care 1995; 18:77-82. [CrossRef]
40. Barber BK, Olsen JE, Shagle SC. Associations between parental psychological and behavioral control and youth internalized and externalized behaviors. Child Dev 1994; 65:1120-1136. [CrossRef]
41. Chen ZY. Ethnic similarities and differences in the association of emotional autonomy and adolescent outcomes: comparing Euro-American and Asian-American adolescents. Psychol Rep 1999; 84:501-516. [CrossRef]